recognition of the equality of their courses to those of the older gymnasium.

A fundamental tendency in the early university instruction is towards a closer coordination with applications. In a less marked degree the coordination of the various mathematical subjects has been considered. The latter seems wise, as reforms should begin at home. Before considering the closer union of mathematics and physics, for instance, it might be well to consider whether the water-tight compartments of the various mathematical subjects are not doing more mischief than those between the various departments. While mathematics should be taught with a view to helpfulness to other departments, yet its first duty is to help itself and to secure its own harmonious development. A starveling can not render strong service to others.

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SCIENTIFIC BOOKS.

California Mammals. By Frank Stephens. Illustrated by W. J. Fenn from studies in the field. Published by the West Coast Publishing Co., San Diego, California, 1906. 8vo, pp. 352, frontispiece, 6 half-tone plates, 40 illustrations in the text, and a faunal map.

'California Mammals,' by Mr. Stephens, is noteworthy as being the first recent local 'handbook' of the mammals of any part of North America, and fortunately sets a fairly good standard for the many similar much-needed local manuals of our mammals that we hope may speedily follow. The scope of the work is "California and that part of the Pacific Ocean properly belonging to California. All the mammals described are known to have been found within the state or within sight of its shores." The number of species and subspecies treated is 276—a surprisingly large number, yet readily explained by the great latitudinal extent of the state, and its extremely diversified character, ranging from the subtropical desert areas of the southeastern part to the subarctic snow-covered summits of the Sierra Nevada.

Although diagnoses of the higher groups, from class to genus, are given, the work is written as far as practicable in non-technical phraseology, but for the convenience of such readers as may not be familiar with some of the terms necessarily employed, a three-page glossary is supplied. Mr. Stephens is well equipped for his work, having had a long field experience as a natural history collector in California, and is thus able to give the ranges of the species and subspecies, particularly of the southern two-thirds of the state, largely from his own personal knowledge. The descriptions of the forms are brief, but for the most part give all there is to say. These are followed by a statement of the type locality and range, and by a few lines to several pages of original biographical matter, according to the circumstances of the case. There is no synonymy, nor any bibliographical references, but the life histories are an important contribution. The illustrations are not numerous, and relate wholly to external features. Good figures of skulls of a considerable number of genera would have been a valuable addition; an extended bibliography was obviously beyond the scope of the work, but a list of titles of the principal papers relating to California mammals would have been useful. The book had to have its limitations, and for a work so well done as is this, and containing so much that is convenient and valuable, it is perhaps hardly fair to make suggestions that the author, perhaps, considered and found impracticable of execution. There is only one thing to say in the matter of serious criticism, and that is that the work is worthy of better typographical execution. The text, as to matter and style, is excellent, but the proofreading is unfortunately defective.

The work is intended for 'beginners' and not for experts, yet it is doubtless equally welcome to both, and for the first class it has been put together with excellent judgment. For many of the subspecies, especially in certain groups, it is almost impossible to give

any characters by which they can be distinguished from their next of kin. The differences are merely comparative and often intangible, and the author kindly warns his readers that they can not hope to satisfactorily discriminate between them; and that when certain groups 'are critically studied as a whole,' as in the case of *Thomomys,* a considerable number of them 'will probably be dropped.' Under coyotes, of which three *species* are credited to California, he says: "Little harm would be done if all the California coyotes were grouped together under the name [*Canis*] *ochropus.* * * * Those not experts will find it difficult to determine the species of coyotes."

Following the main text is a chapter on 'Life Areas in California' (pp. 283–291), illustrated with a map, on which are indicated the seventeen faunal divisions the author has found it desirable to recognize. This is followed by a 'List of California Mammals and their Faunal Distribution,' which is noted by means of references to the map. A glossary and a very full index (40 pages) close the volume. J. A. ALLEN.

Physiology of the Nervous System. By J. P. MORAT, of the University of Lyons. Authorized English edition, translated and edited by H. W. SYERS, M.A., M.D. (Cantab.), Physician to the Great Northern Central Hospital. With 263 illustrations (66 in colors). Chicago, W. T. Keener & Co. 1906. Pp. xxviii + 680.

This work, a portion of the 'Treatise on Physiology' by Professors Morat and Doyon, is a full and systematic exposition of the physiology of the nervous system. The subject has been treated with great clearness and conciseness. The elementary nervous functions, including the anatomy and functions of the neuron in general, the methods of using electricity in the study of nerve actions and the effects of nerve poisons, are discussed in the first part. The individuality of the neuron is brought out as the essential point in the theory of the nervous element without entering into a technical discussion on the *continuity* or the *contiguity* of the articulated prolongations of these neurons. With reference to the question of nervous amœbism, as with other mooted points which at the present time only lead to fruitless discussion, the author takes a neutral stand. The laws of Waller, in modified form, are described in a clear manner. The views of Bethe, opposed to the Wallerian idea of the regeneration of the peripheral stump of the severed nerve, are not discussed, perhaps, to the advantage of the lucid presentation of the general laws of nerve degeneration. Death by electricity is discussed in the light of recent experiments on animals and of accidents arising in industrial applications of high-tension electrical currents.

The systematic functions, *i. e.,* the functions which originate in the associations and definite relationships which are established between the cellular functions, are discussed in the second part of this work. The relationships of sensation and motion are defined very concisely. In introducing this important chapter the author tersely says:

> Except for the infinitesimal part which each one of us plays therein a knowledge of the living world is based on anthropomorphic reasoning, and it is impossible to base it on any other reasoning. Hence it is necessary to exert great prudence in employing it.

This part contains sub-chapters on the metamerism of the spinal nerves; and their functions, and the fundamental determinations of the cranial nerves. The pneumogastric and trigeminal nerves are very thoroughly treated. The chorda tympani is regarded, together with the two superficial petrosal nerves, as the principal continuation of the nerve of Wrisberg (nervus intermedius). In the second chapter the reflexes, conscious, sub-conscious and unconscious, are classified and described extensively. The author avoids attempting to explain the mechanism of inhibition, but indicates by comparisons how this phenomenon belongs to the category of explicable facts of which the explanation itself is wanting.

The most noteworthy and interesting por-